Predicting penicillin resistance in patients with gonorrhoea

Demographic data

The study was undertaken at Whittall Street STI clinic, Birmingham. Of the 334 cases of gonococcal infection, 216 (64.7%) were male. Ages ranged from 14 to 58 years. Ethnicity data revealed that 179 (53.6%) cases were Afro-Caribbean, 64 (19.2%) were white, 25 (7.5%) were other specified groups, there was no information regarding the ethnic origin of the remaining 66 (19.8%). While all episodes included were new presentations, 205 (61.4%) admitted to previous infection with *Neisseria gonorrhoeae*.

Methods

The study was retrospective and conducted on all patients diagnosed with gonococcal infection during the 8 month period between 1 June 1997 and 31 January 1998. Specimens for gonorrhoea culture were plated onto Columbia agar enriched with 10% saponin lysed horse blood, containing vancomycin, colistin, nystatin, and trimethoprim. These were incubated at 37°C with 7% carbon dioxide for 48 hours. Any *N gonorrhoeae* organisms isolated were then cultured on isosensitest agar to ascertain penicillin sensitivity using discs containing 0.03, 0.25, and 1.00 units. Intermediately sensitive isolates were grouped with fully sensitive isolates for analysis.

Case notes were retrieved of patients identified from the laboratory list of positive gonococcal cultures. Information noted comprised age, sex, ethnicity, number of contacts, history of gonorrhoea, sexual orientation, postcode (this allocated a Jarman 8 score where a high score reflected socioeconomic deprivation),[1] and where infection was acquired. These data were appended to penicillin sensitivity on an ACCESS database and subsequently analysed using the SPSS software package.

Results

See table 1.

Table 1 Summary of demographic and sexual history variables against penicillin sensitivity

	Resistant	*Sensitive*	*p Value*
Age (years)			
<16	0	4 (100%)	<0.01
16–20	2 (2%)	100 (98%)	
21–25	6 (6%)	94 (94%)	
26–30	5 (8.8%)	52 (91.2%)	
31–35	6 (14.3%)	36 (85.7%)	
>35	7 (24.1%)	22 (75.9%)	
Sex			
male	21 (9.7%)	195 (90.3%)	0.05
female	5 (4.2%)	113 (95.8%)	
Ethnicity			
Afro-Caribbean	5 (2.8%)	174 (97.2%)	<0.01
white	5 (7.8%)	59 (92.2%)	
other	5 (20.0%)	20 (80.0%)	
unknown	11 (16.6%)	55 (83.3%)	
No of contacts			
≤1	18 (8.5%)	195 (91.5%)	0.78
>1	8 (6.7%)	111 (93.3%)	
Previous gonorrhoea			
yes	18 (8.8%)	187 (91.1%)	0.26
no	8 (6.2%)	121 (93.8%)	
Sexual orientation			
heterosexual	21 (6.8%)	289 (93.2%)	0.03
homosexual/bisexual	5 (20.8%)	19 (79.2%)	
Jarman score			
highest third	4 (4.8%)	80 (95.2%)	0.16
middle third	6 (8.7%)	63 (91.3%)	
lowest third	4 (4.7%)	81 (95.3%)	
Where acquired			
UK	22 (6.9%)	296 (93.1%)	<0.01
non-UK	4 (36.4%)	7 (63.6%)	
unknown	0	5 (100%)	

Comment

During the study period first line therapy for *N gonorrhoeae* infection was amoxycillin 3 g with probenicid 1 g immediately. Only in patients where infection was acquired in a country with a high probability of penicillin resistance would an alternative treatment have been used. The aim of this study was to ascertain whether resistant gonococci could be reliably identified from the sexual history. Previously identified risk factors include location acquired,[2] homosexuality,[3] and varying racial groups.[4 5]

Guidelines recommend first line antibiotics assuming resistance rates of less than 5%.[6] In our patients the figure was 7.4%, and only a small proportion of these would have received alternative treatment. Isolates insensitive to penicillin increased significantly with age, homosexuality, and in white people. Clearly these variables are not mutually exclusive and in multivariate analysis no individual factor remained significant. Using non-UK acquired infection and homosexual contact would identify 39 patients, of which one in four had resistant infections. However, even when these groups are excluded the remaining patients had a penicillin resistance rate of 5.4%. This suggests that the identification of risk factors is not sensitive enough to base the choice of treatment upon and first line treatment with a fluoroquinolone is more appropriate.

A GOODFELLOW
T STANDLEY
J D C ROSS
Whittall Street Clinic, Birmingham

Correspondence to: Dr JDC Ross, Department of GU Medicine, Whittall Street Clinic, Birmingham B4 6DH.

1 Lacey CJN, Merrick DM, Bensley DC, *et al.* Analysis of sociodemography of gonorrhoea in Leeds 1989–1993. *BMJ* 1997;**314**:1715–18.
2 Easmon CSF. Gonococcal resistance to antibiotics. *J Antimicrob Chemother* 1985;**16**:409–12.
3 Hunter Hansfield H, Knapp JS, Diehr PK, *et al.* Correlation of auxotype and penicillin susceptibility of Neisseria gonorrhoeae with sexual preferance and clinical manifestations of gonorrhoea. *Sex Transm Dis* 1980:7:1–5.
4 Silver PS, Darling WM. Penicillin insensitive gonococci in the Bolton area. Preponderance in young women and immigrants. *Br J Vener Dis* 1971;**47**:367–72.
5 Rodin P, Seth AD, King DM, *et al.* Sensitivity to penicillin of gonococci in different racial groups. *Br J Vener Dis* 1980;**56**:308–10.
6 van de Laar MJW, van Duynhoven YTHP, Dessens M, *et al.* Surveillance of antibiotic resistance in the Netherlands, 1977–95. *Genitourin Med* 1997;**73**:510–17.